

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

Rec'd PCT/PTO 13 DEC 2004

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|---|---|
| Applicant's or agent's file reference Flut_101 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/IN 03/00219 | International filing date (day/month/year) 16 June 2003 (16.06.2003) | (Earliest) Priority Date (day/month/year) 20 June 2002 (20.06.2002) |
| Applicant SUN PHARMACEUTICAL INDUSTRIES LIMITED | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (See Box II).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.: _____

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.
- ☒ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN 03/00219-0

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Group I, claims 1-22: a process for the preparation of fluticasone propionate by
a) treating the N,N-dimethylcarbamoylthiocarbonyl derivative of formula 3 with an alkali metal carbonate/alcohol system to obtain the corresponding carbothioic acid derivative 4;
b) reacting compound 4 with bromofluoromethan to obtain fluticasone propionate;

Group II, claims 23-31: a process for the preparation of fluticasone propionate by
a) reacting the androstadien carboxylic acid of formula 2 with N,N-dimethylthiocarbamoyl chloride in an inert aprotic solvent with an iodide catalyst and a base to give the N,N-dimethylcarbamoylthiocarbonyl derivative of formula 3
b) reacting compound 3 with a hydrosulfide reagent and bromofluoromethane to obtain fluticasone propionate;

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/IB/00219-0

CLASSIFICATION OF SUBJECT MATTER

IPC⁷: C07J 31/00, 75/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: C07J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

REGISTRY, CASREACT, CAPLUS, WPI, EPODOC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|---|-----------------------|
| A | WO 01/62722 A2 (ABBOT LABORATORIES) 30 August 2001 (30.08.01) <i>the whole document, esp. pages 3-5, page 10 lines 8-9, Scheme 1 on page 12, page 13 line 13 - page 14 line 15, examples 3, 4, 5, 7, 8, claims.</i> | 1-31 |
| A | GB 2088877 A (GLAXO GROUP LIMITED) 16 June 1982 (16.06.82) <i>the whole document, esp. pages 1-4, preparations.</i> | 1-31 |
| A | IL 109656 A1 (CHEMAGIS LTD.), 22 February 1998 (22.02.98) (abstract) CASREACT [online], Chemical Abstracts online [retrieved on 24.11.2003]. Retrieved from: CASREACT Database, STN-International, Karlsruhe (DE), CASREACT Accession no. 129:276096; <i>abstract, reaction schemes.</i> | 1-31 |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

24 November 2004 (24.11.2004)

Date of mailing of the international search report

17 February 2004 (17.02.2004)

Name and mailing address of the ISA/AT

Austrian Patent Office
Dresdner Straße 87, A-1200 Vienna

Facsimile No. 1/53424/535

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Form PCT/ISA/210 (second sheet) (July 1998)

Best Available Copy

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IN 03/00219-0

| Patent document cited in search report | | | Publication date | Patent family member(s) | Publication date |
|---|---|---------|---------------------|----------------------------|---------------------|
| GB | A | 2088877 | | CA A 1205464 | 1986-06-03 |
| | | | | IE L 862287L | 1981-08-15 |
| | | | | IE L 810282L | 1981-08-15 |
| | | | | SK B 278140B | 1996-02-07 |
| | | | | ES A 8600936 | 1986-02-16 |
| | | | | ES A 8502447 | 1985-04-01 |
| IL | A | 109656 | 1998-02-22 | none | |